PATENT ABSTRACTS OF JAPAN

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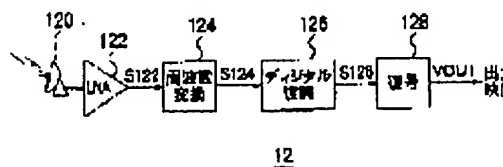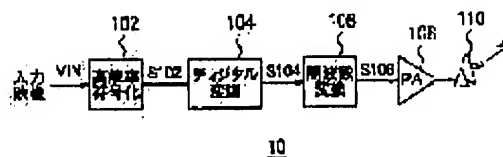(22)Date of filing :   24.02.1995   (72)Inventor :   KOJIMA YUICHI

(54) VIDEO DATA TRANSMITTER, VIDEO DATA RECEIVER AND VIDEO DATA TRANSMISSION SYSTEM USING THE SAME

(57)Abstract:

PURPOSE: To provide a video data transmission system or the like capable of letting a user transmit video data by a suitable transmission method corresponding to the use and the purpose of video signals.

CONSTITUTION: Corresponding to the use and the purpose of input video data VIN, this video data transmitter 10 once records the input video data VIN to be the object of editing work after demodulation for instance, then generates the transmission signals of a non-real-time transmission rate by compression-encoding them by low compressibility or generates real-time transmission signals by compression-encoding the input video data VIN of the on-the-spot relay of sports for instance by high compressibility and transmits them through a satellite communication channel to this video data receiver 12.

LEGAL STATUS

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[Date of registration]

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decision of rejection]

[Date of extinction of right]

CLAIMS

[Claim(s)]
[Claim 1] A compression means to carry out compression coding of the incompressible image data by
the predetermined approach, and to generate the 1st compression image data of the real time data rate
corresponding to said incompressible image data, 1st record / playback means which records said
compression image data, reproduces said recorded compression image data at a different data rate from
said real time data rate, and generates the 2nd compression image data, A selection means to choose said
1st compression image data or said 2nd compression image data according to a change signal, and to
output as a selection signal, The image data source which has an image data transmitting means to
transmit Reed-Solomon coding and a coding means to convolutional-code-ize and to generate a
transmission signal, and said transmission signal for said selection signal.
[Claim 2] Said image data transmitting means is the image data source according to claim 1 which has a
digital modulation means to generate the transmission signal which carries out digital modulation of the
carrier signal with the transmission speed according to the data rate of the 1st [said] compression image
data contained in said transmission signal, or said 2nd compression image data, and suits a
predetermined communication line, and a transmitting means to transmit said transmission signal to said
communication line.
[Claim 3] Said compression means is the image data source according to claim 1 or 2 which compresses
said incompressible image data with the compressibility in which the case where it records on said
record / playback means differs from the case where it does not record on said record / playback means.
[Claim 4] The 1st real time compression image data of a data rate which carried out compression coding
of the incompressible image data by the predetermined approach, Or an image data receiving means to
receive Reed-Solomon coding and the convolutional-code-ized transmission signal including the 2nd
compression image data of a different data rate from said real time data rate, A decode means to Lead-
Solomon-decode, and to collapse and to decode said received transmission signal, 2nd record / playback
means which records said 2nd compression image data contained in said said decoded transmission
signal, and is reproduced at a predetermined data rate, The image data sink which has an expanding
means to elongate said 2nd playback compressed data reproduced at said the 1st compression image data
or said predetermined data rate contained in said transmission signal.
[Claim 5] It is the image data sink according to claim 4 with which said transmission signal conforms to
a predetermined communication line, it is transmitted to the image data sink concerned through this
communication line, and said image data receiving means has the digital recovery means which carries
out the digital recovery of the transmission signal with the transmission speed according to the 1st
[said] compression image data contained in said transmission signal which a receiving means receive
said transmission signal, and said receiving means received, or said 2nd compression image data from
said communication line.
[Claim 6] For said 1st compression image data and said 2nd compression image data, said expanding
means is an image data sink according to claim 4 or 5 which elongates these by the approach are
compressed with different compressibility and corresponding to the compressibility of said 1st

compression image data or said 2nd compression image data.
[Claim 7] The image data transmission system which has the image data source according to claim 3 and an image data sink according to claim 6.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the image data sink used for transmission of image data by which compression coding was carried out, the image data source, and the image data transmission system using these.
[0002]
[Description of the Prior Art] for example, the video-signal transmission system which transmits a video signal to a broadcasting station from the coverage site of news through a satellite communication circuit -- setting -- a video signal -- an analog FM modulation -- carrying out -- the video signal at the time of photography -- transmission is performed with the signal speed (real-time rate) as it is. Drawing 5 is drawing showing the configuration of the conventional video-signal sending set 80. Drawing 6 is drawing showing the configuration of the conventional video-signal receiving set 90. As shown in drawing 5 , the video-signal receiving set 90 carries out FM modulation of the input video signal VIN inputted from the outside by the FM modulation circuit 82, makes it the modulating signal S82 of an intermediate frequency band, is changed into the transmission signal S84 of the frequency which suits a satellite communication circuit by the frequency changing circuit (up converter) 84, carries out power amplification by the power amplification circuit 86, and is transmitted through the transmitting antenna 88.
[0003] On the other hand, the video-signal receiving set 90 receives a transmission signal from a satellite communication circuit through a receiving antenna 92, amplifies it by the low noise amplifying circuit 94, is changed into an intermediate frequency band by the frequency changing circuit (down converter) 94, and it gets over by the FM demodulator circuit 98, and it is outputted as an output video signal VOUT corresponding to the original input video signal VIN.
[0004]
[Problem(s) to be Solved by the Invention] Since the video-signal sending set 80 and the video-signal receiving set 90 which were mentioned above as a conventional technique transmit a video signal in real time, they cannot respond to the request of wanting to carry out high-speed transmission of the image recorded in the news coverage site, for example using the camcorder/movie etc. in order to fully secure the edit processing time by the televising time of day of news. On the other hand, since the image of sport play-by-play broadcasting etc. does not usually need to perform edit processing in a hurry, there is no need for such high-speed transmission.
[0005] This invention aims at offering the image data source which can shorten sharply the time amount which it is made in view of the trouble of the conventional technique mentioned above, for example, transmission of a news material image with high urgency takes, an image data sink, and the image data transmission system using these. Moreover, this invention aims at offering the image data source to which not only the above-mentioned high-speed transmission but a user can transmit a video signal by suitable compressibility and the transmission approach according to the application and the purpose of a video signal, an image data sink, and the image data transmission system using these.

[0006]
[Means for Solving the Problem] The image data source applied to this invention in order to attain the above-mentioned purpose A compression means to carry out compression coding of the incompressible image data by the predetermined approach, and to generate the 1st compression image data of the real time data rate corresponding to said incompressible image data, 1st record / playback means which records said compression image data, reproduces said recorded compression image data at a different data rate from said real time data rate, and generates the 2nd compression image data, A selection means to choose said 1st compression image data or said 2nd compression image data according to a change signal, and to output as a selection signal, It has an image data transmitting means to transmit Reed-Solomon coding and a coding means to convolutional-code-ize and to generate a transmission signal, and said transmission signal for said selection signal.

[0007] Suitably, said image data transmitting means carries out digital modulation of the carrier signal with the transmission speed according to the data rate of the 1st [said] compression image data contained in said transmission signal, or said 2nd compression image data, and has a digital modulation means to generate the transmission signal which suits a predetermined communication line, and a transmitting means to transmit said transmission signal to said communication line. Suitably, said compression means compresses said incompressible image data with the compressibility in which the case where it records on said record / playback means differs from the case where it does not record on said record / playback means.

[0008] Moreover, the 1st real time compression image data of a data rate to which the image data sink concerning this invention carried out compression coding of the incompressible image data by the predetermined approach, Or an image data receiving means to receive Reed-Solomon coding and the convolutional-code-ized transmission signal including the 2nd compression image data of a different data rate from said real time data rate, A decode means to Lead-Solomon-decode, and to collapse and to decode said received transmission signal, 2nd record / playback means which records said 2nd compression image data contained in said said decoded transmission signal, and is reproduced at a predetermined data rate, It has an expanding means to elongate said 2nd playback compressed data reproduced at said the 1st compression image data or said predetermined data rate contained in said transmission signal.

[0009] It is a digital recovery means to by_which said transmission signal conforms to a predetermined communication line, it is suitably transmitted to the image data sink concerned through this communication line, and said image data receiving means carries out the digital recovery of the transmission signal from said communication line with the transmission speed according to the 1st [said] compression image data contained in said transmission signal which a receiving means to receive said transmission signal, and said receiving means received, or said 2nd compression image data. It is suitably compressed with different compressibility from said 1st compression image data and said 2nd compression image data, and said expanding means elongates these by the approach according to the compressibility of said 1st compression image data or said 2nd compression image data.

[0010] Moreover, the image data transmission system concerning this invention has an image data sink concerning this invention of one of the above, and the image data source concerning this invention of one of the above which suits this image data sink.

[0011]
[Function] In the image data source concerning this invention, a compression means compresses image data with high compressibility, when compressing image data with low compressibility in compressing the image data of which the high quality for example, corresponding to image edit processing is required, and compressing the image data of which especially high quality is not required. 1st record / playback means records the image data compressed, for example with low compressibility, and when the recorded image data signal is restored, it reproduces at a different data rate from the data rate (real time data rate) which can acquire the image of the same speed as the original video signal, and it generates the 2nd image data. A selection means chooses said 1st compression image data or the 2nd compression image data according to a change signal, and outputs it as a selection signal. a coding means -- said

selection signal -- Reed-Solomon coding -- and it convolutional-code-izes and a transmission signal is generated. An image data transmitting means transmits the image data of the above 1st, or the 2nd image data to a communication line as a transmission signal according to **'s and others data rate.

[0012] The image data sink concerning this invention receives the transmission signal which the image data source concerning above-mentioned this invention transmitted, it is equipment which outputs the original image data, and an image data receiving means receives the transmission signal containing the compression image data of the above 1st, or the 2nd compression image data from a communication line by the approach according to these data. It Lead-Solomon-decodes, and collapses and a decode means decodes said received transmission signal. 2nd record / playback means is reproduced at the predetermined data rate suitable for the edit equipment which records said 2nd compression image data contained in the decoded transmission signal, for example, is connected to the image data sink concerned. An expanding means performs expanding processing according to compressibility to said 1st compression image data or said 2nd compression image data, and supplies it to the device connected to the image data sink concerned.

[0013]

[Example 1] Hereafter, the 1st example of this invention is explained. Drawing 1 is drawing showing the configuration of the image data source 10 concerning this invention in the 1st example. Drawing 2 is drawing showing the configuration of the image data sink 12 concerning this invention in the 1st example. As shown in drawing 1 , the image data source 10 consists of high-efficiency-coding equipment 102, the digital modulation circuit 104, a frequency changing circuit 106, a power amplification circuit (PA) 108, and a transmitting antenna 110, carries out high efficiency coding of the input image data VIN of a digital format, generates a transmission signal, and transmits this transmission signal to a satellite communication circuit.

[0014] As shown in drawing 2 , the image data sink 12 It consists of a receiving antenna 120, the low noise amplifying circuit (LNA) 122, a frequency changing circuit 124, a digital demodulator circuit 126, and a decoder circuit 128. The transmission signal which the image data source 10 has transmitted through a satellite communication circuit is received. It decodes, the output image data VOUT corresponding to the original input image data VIN are generated, and this output image data VOUT is supplied to image edit equipment or a recording device connected to the image data sink 12.

[0015] Hereafter, actuation of the image data source 10 and the image data sink 12 is explained. High efficiency coding of the input image data VOUT inputted into the image data source 10 is carried out by high-efficiency-coding equipment 102, and they are outputted to the digital modulation circuit 104 as coding image data S102. The digital modulation circuit 104 carries out digital modulation of the coding image data S102, and outputs them to a frequency changing circuit 106 as a modulating signal S104 of an intermediate frequency band.

[0016] A frequency changing circuit (up converter) 106 changes a modulating signal S104 into the frequency which suited the satellite communication circuit, and outputs it to the power amplification circuit 108 as a transmission signal S106. The power amplification circuit 108 carries out power amplification of the transmission signal S106 to a predetermined transmitting output, and transmits it to a satellite communication circuit through the transmitting antenna 110. The transmission signal which the image data source 10 transmitted is transmitted to the image data sink 12 through a communication satellite (not shown).

[0017] The low noise amplifying circuit 122 of the image data sink 12 amplifies the transmission signal from the image data source 10 which won popularity through the receiving antenna 120, and outputs it to a frequency changing circuit 124 as an input signal S122. A frequency changing circuit (down converter) 124 changes an input signal into the input signal S124 of an intermediate frequency band, and outputs it to the digital demodulator circuit 126.

[0018] The digital demodulator circuit 126 restores to an input signal S124 by the approach corresponding to the digital modulation circuit 104 of the image data source 10, generates the recovery signal S126, and outputs it to a decoder circuit 128. A decoder circuit 128 decodes the recovery signal S126, and supplies it to an external device as output image data VOUT corresponding to the original

input image data VIN. By using the image data transmission system using the image data source 10 and the image data sink 12 which were explained above, image data can be transmitted using a satellite communication circuit.

[0019]

[Example 2] Hereafter, the 2nd example of this invention is explained. In the image data transmission system using the image data source 10 (drawing 1) and the image data sink 12 (drawing 2) which were shown in the 1st example From the constraint of the working speed of the decoder circuit 128 of the high-efficiency-coding equipment 102 of the image data source 10, and the image data sink 12 which performs coding and decode of the image data of the high sampling frequency for broadcasting service A transmission signal can be transmitted only at the data rate (real time data rate) which can acquire the image of the speed same after decode in fact as the image of the original image data. For example, the demand of wanting to transmit compression image data [finishing / inclusion to a record regenerative apparatus] to a broadcasting station in a coverage site for a short time was not able to be met.

[0020] Moreover, in the image data transmission system using the image data source 10 and the image data sink 12, the compressibility of high efficiency coding becomes settled with the bandwidth of the satellite communication circuit which can be used for transmission of a transmission signal. Therefore, when the image data which are not fit for high-pressure shrinking percentage coding are encoded and transmitted with the high compressibility according to the bandwidth of a satellite communication circuit, the problem of the quality of the image after decode deteriorating arises.

[0021] Moreover, since image quality degradation accompanying edit processing is further added when performing edit processing to the image data after decode, there is a request that he wants to transmit image data from a photography site by approach by which a quality image is acquired after decode. However, in transmission of the image data in the real time data rate using the image data source 10 and the image data sink 12, such a request cannot be met from a limit of the band of a satellite communication circuit. The image data transmission system using the image data source 20 and the image data sink 22 which are shown below is for solving the trouble of the image data transmission system which consists of the image data source 10 and an image data sink 12, and responding to the above-mentioned request.

[0022] Drawing 3 is drawing showing the configuration of the image data source 20 in the 2nd example. Drawing 4 is drawing showing the configuration of the image data sink 22 in the 2nd example. In addition, what attached the sign same what attached the same sign as each component of the image data source 10 shown in drawing 1 among each component of the image data source 20 shown in drawing 3 and same as each component of the image data sink 12 shown in drawing 1 among each component of the image data sink 22 shown in drawing 4 is the same.

[0023] As shown in drawing 3 , the image data source 20 consists of high-efficiency-coding equipment 200, the data selection circuitry (SEL) 202, data accumulation equipment 204, the error correcting code addition circuit 206, a digital modulation circuit 208, a control circuit 210, and a sending set 14. A sending set 14 consists of a frequency changing circuit 106, a power amplification circuit 108, and a transmitting antenna 110, carries out high efficiency coding of the input image data VIN set as the object of transmission by the approach according to its purpose and application, generates a sending signal, and transmits it on a satellite communication circuit.

[0024] As shown in drawing 4 , the image data sink 22 consists of a receiving set 16, the digital demodulator circuit 220, the error correction circuit 222, data accumulation equipment 224, a data selection circuitry (SEL) 226, decode equipment 228, and a control circuit 230. A receiving set 16 consists of a receiving antenna 120, a low noise amplifying circuit 122, and a frequency changing circuit 124. The transmission signal sent through a satellite communication circuit from the image data source 20 is received, a transmission signal is restored to it and decoded by the approach according to the transmission speed and compressibility, and devices, such as external image edit equipment, are provided with the output image data VOUT corresponding to the original input image data VIN.

[0025] The high-efficiency-coding equipment 200 of the image data source 20 changes compressibility

according to control through the control signal C200 of the control circuit 210 according to the purpose and application of the input image data VIN, carries out compression coding of the input image data VIN, and outputs them to the data selection circuitry 202 and data accumulation equipment 204, respectively as compression image data S200a and S200b.

[0026] Data accumulation equipment 204 records compression image data S200b inputted from high-efficiency-coding equipment 200 on record media, such as a magneto-optic disk and a hard disk, according to control of the control circuit 210 through a control signal C204. Moreover, data accumulation equipment 204 reproduces the recorded video signal with a different transmission speed from a real time data rate according to control of a control circuit 210, and outputs it as compression image data S204 to the data selection circuitry 202.

[0027] The data selection circuitry 202 chooses compression image data S200a and either of S204 which were inputted according to control of the control circuit 210 through a control signal C202 (change signal), and outputs them as compression image data S202 (selection signal) to the error correcting code addition circuit 206. The data selection circuitry 202 chooses compression image data S200a, when the input image data VIN are not set as the object of edit processing, and when the input image data VIN are not set as the object of edit processing, specifically, it chooses the compression image data S204.

[0028] According to control of the control circuit 210 through a control signal C206, Reed-Solomon coding is performed to the compression image data S202, and it collapses further, it encodes, and the error correcting code addition circuit 206 is outputted to the digital modulation circuit 208 as a transmission signal S206. According to control of the control circuit 210 through a control signal C208, digital modulation of the transmission signal S206 is carried out by the modulation approach according to the transmission speed, and the digital modulation circuit 208 outputs it to a sending set 14 as a modulating signal S208 of an intermediate frequency band.

[0029] A sending set 14 changes a modulating signal S208 into the transmission signal which suited the satellite communication circuit, and transmits it on a satellite communication circuit. The transmission signal transmitted from the sending set 14 is relayed by the communication satellite (not shown), and turns into an input signal of the image data source 20. The receiving set 16 of the image data sink 22 receives a transmission signal from a satellite communication circuit, and outputs it to the digital demodulator circuit 220 as an input signal S124.

[0030] According to control of the control circuit 230 through a control signal C220, the digital demodulator circuit 220 carries out a digital recovery by the approach according to the transmission speed, and outputs an input signal S124 to the error correction circuit 222 as a recovery signal S220. In addition, it is also possible not to follow control of a control circuit 230, but for digital demodulator circuit 220 the very thing to identify the transmission speed of a transmission signal, and for it to be made to perform the recovery according to the identified transmission speed.

[0031] According to control of the control circuit 230 through a control signal C222, the error correction circuit 222 performs an error correction to the recovery signal S220, decodes it by the approach corresponding to the error correcting code addition circuit 206 of the image data source 20, and is outputted to the data selection circuitry 226 and data accumulation equipment 224 as compression image data S222.

[0032] According to control of the control circuit 230 through a control signal C224, data accumulation equipment 224 reads the compression image data which recorded and recorded the compression image data S222 (compression image data specifically transmitted with non-real-time-transmission speed from the image data source 20) at a real-time rate, and outputs them to the data selection circuitry 226 as compression image data S224.

[0033] According to control of the control circuit 230 through a control signal C226, the data selection circuitry 226 chooses either of the compression image data S222,224, and outputs it to decode equipment 228 as compression image data S226. Decode equipment 228 performs expanding processing by the approach according to the compressibility of the compression image data S226, and supplies it to the device by which the output image data VOUT corresponding to the original input image data VIN were connected outside.

[0034] Hereafter, actuation of the image data source 20 and the image data sink 22 is explained. the image data source 20 records once, after becoming a quality image after decode carries out compression coding of the input image data VIN demanded (for example, set as the object of edit processing after a recovery) according to the application and the purpose of the input image data VIN with low compressibility (the amount of the compression image data after compression increases -- as), and it generates a non-real-time-transmission signal.

[0035] moreover, becoming a quality image after decode carries out compression (amount of compression image data after compression decreases -- as) coding of the input image data (for example, play-by-play broadcasting of a sport) VIN which are not demanded with high compressibility, and the image data source 20 generates a real-time-transmission signal. The image data source 20 transmits either of these transmission signals through a satellite communication circuit to the image data sink 22.

[0036] The image data sink 22 receives the transmission signal from the image data source 20, and carries out a digital recovery according to the transmission speed of a transmission signal. Furthermore, the image data sink 22 decodes a transmission signal by the approach according to the compressibility. That is, once becoming a quality image after decode records the transmission signal corresponding to the input image data VIN demanded, the image data sink 22 is reproduced and decoded at a real-time rate, and is supplied to an edit device etc. On the other hand, without becoming a quality image after decode recording the transmission signal corresponding to the input image data VIN which are not demanded, it decodes in real time and the image data sink 22 is outputted.

[0037] As stated above, when transmitting image data at a real-time rate according to the image data transmission system concerning this invention using the image data source 20 and the image data sink 22, it becomes possible by setting up each component of the image data source 20 appropriately to transmit image data only by the time difference of the sum of internal delay of the image data source 20 and the image data sink 22 and the transit delay on a communication line.

[0038] Moreover, when transmitting image data at a non-real-time rate, it is possible to transmit the image data encoded with the compressibility of arbitration with the transmission speed which suited the transmission capacity of transmission lines, such as a satellite communication circuit, to for example, the image data sink 22 side by recording the image data after compressing into data accumulation equipment one by one, once reproducing the recorded data with non-real-time transmission speed, and generating a transmission signal. Moreover, non-real-time rate transmission of high-speed transmission etc. is attained [consequently] to obtain the output image data VOUT of the same speed as the original input image data by the image data sink 22 by once reproducing it with real-time transmission speed, after recording the input signal after a recovery on data accumulation equipment.

[0039] moreover -- for example, the function of the image data transmission system using the image data source 10 and the image data sink 12 which were shown in the 1st example when the image data transmission system concerning this invention was used for transmission of the image data for broadcasting service -- adding -- already -- inclusion -- finishing -- transmission of the image data of the news material image which needs to hurry edit processing in a broadcasting station etc. can perform now in a short time compared with the image data transmission system using the image data source 10 and the image data sink 12. Therefore, the convenience of a junction image and the news image which uses abundantly the combination of the image which carried out edit processing can be raised as a result more sharply than before by using it according to the application and the purpose of the input image data VIN, changing these functions.

[0040] Moreover, since image data can be transmitted with the transmission speed doubled with the frequency bandwidth of an usable repeater when transmitting if the image data transmission system concerning this invention is used for transmission through the repeater of a communication satellite, the frequency band which can be used for transmission can be used efficiently.

[0041] Moreover, according to the image data transmission system concerning this invention, it can transmit so that the decode image quality of a material image with high possibility that image quality will deteriorate by edit processing may become high compared with the decode image quality of the junction image on condition of edit processing, and what the image quality of the junction image in a

broadcast phase and an edit processing image homogenizes as a result is made.

[0042] In addition, the image data transmission system concerning this invention can be used for transmission of the image data which used the terrestrial communication line or the wire circuit other than the satellite communication circuit. Moreover, the image data transmission system concerning this invention can be used for general transmission of data by which changes the high-efficiency-coding equipment 102 and the decode equipment 228 other than transmission of image data, and compression coding is carried out.

[0043] Moreover, each component of the image data transmission system of this invention does not ask . whether it is constituted in hardware, or it is constituted by software, as long as a permutation is possible. The image data source of this invention, the image data sink, and the image data transmission system using these were shown in each example mentioned above, and also they can take various configurations like the modification shown here, for example.

[0044]

[Effect of the Invention] As stated above, the image data source concerning this invention, an image data sink, and the image data transmission system using these can shorten sharply the time amount which transmission of a news material image with high urgency takes. Moreover, as for the image data source concerning this invention, an image data sink, and the image data transmission system using these, a user can transmit a video signal by the suitable transmission approach according to the application and the purpose of a video signal.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the configuration of the image data source concerning this invention in the 1st example.
[Drawing 2] Drawing 2 is drawing showing the configuration of the image data sink concerning this invention in the 1st example.
[Drawing 3] It is drawing showing the configuration of the image data source concerning this invention in the 2nd example.
[Drawing 4] It is drawing showing the configuration of the image data sink concerning this invention in the 2nd example.
[Drawing 5] It is drawing showing the configuration of the conventional video-signal sending set.
[Drawing 6] It is drawing showing the configuration of the conventional video-signal receiving set.
[Description of Notations]
10 20 -- The image data source, 102,200 -- High-efficiency-coding equipment, 104,208 -- A digital modulation circuit, 106 -- A frequency changing circuit, 108 -- Power amplification circuit, 110 -- A transmitting antenna, 202,226 -- A data selection circuitry, 204,224 -- Data accumulation equipment, 206 -- An error correcting code addition circuit, 210,230 -- 12 A control circuit; 22 -- Image data sink, 120 [-- A digital demodulator circuit, 128,228 / -- Decode equipment, 222 / -- An error correction circuit, 224 / -- Data accumulation equipment, 14 / -- A sending set, 16 / -- Receiving set] -- A receiving antenna, 122 -- A low noise amplifying circuit, 124 -- A frequency changing circuit, 126,220
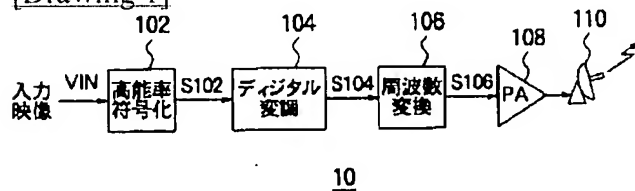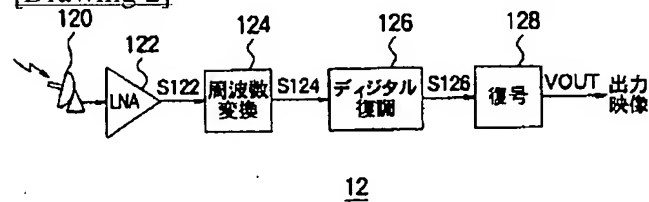

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.
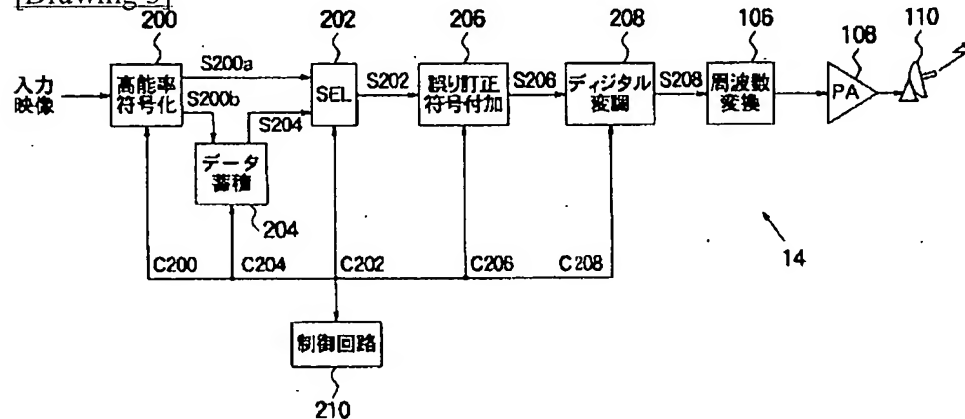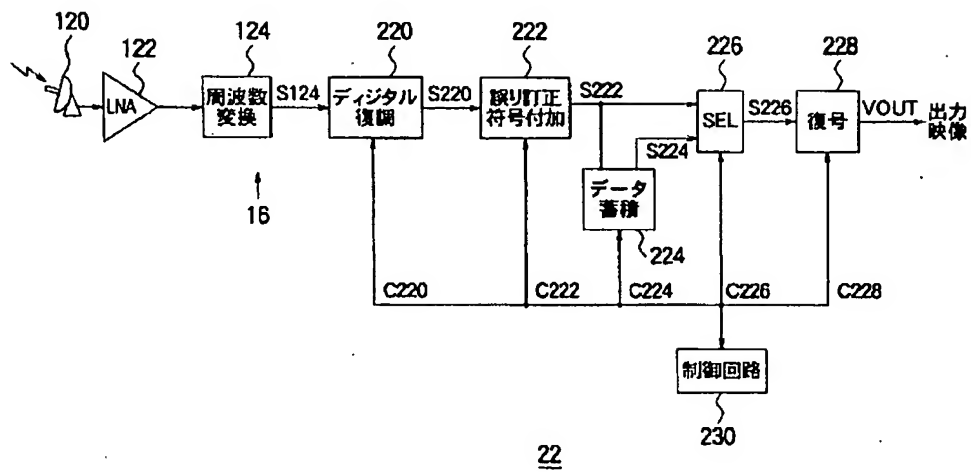

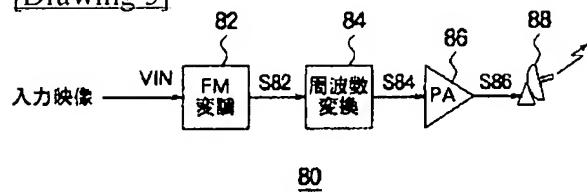DRAWINGS

[Drawing 1]

10

[Drawing 2]
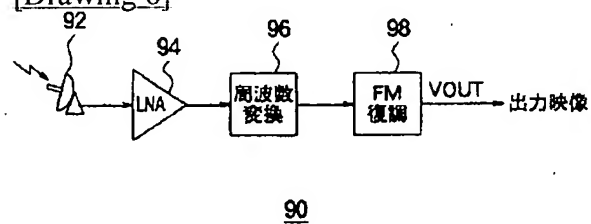

12

[Drawing 3]

20

[Drawing 4]

120 122 124 220 222 226 228

LNA | 周波数変換 | S124 | ディジタル復調 | S220 | 誤り訂正符号付加 | S222 | SEL | S226 | 復号 | VOUT 出力映像

16

S224

データ蓄積

224

C220 C222 C224 C226 C228

制御回路

230

22

[Drawing 5]

82 84 86 88

入力映像 | VIN | FM変調 | S82 | 周波数変換 | S84 | PA | S86

80

[Drawing 6]

92 94 96 98

LNA | 周波数変換 | FM復調 | VOUT 出力映像

90

[Translation done.]